

IN THE CLAIMS:

1-30. (Cancelled).

31. (Currently Amended) An autologous expansion culture medium for a culture in vitro, purification, and expansion of autologous human progenitor stem cells, comprising:

- a) between 0.1% and 90% weight of autologous human serum supplemented with between 0.1 and 10,000 UI/ml heparin and between 0.1 and 10,000 UI/ml protamine; and
- b) a base culture medium including basic nutrients
wherein the autologous human serum is obtained by plasmapheresis with heparin and protamine.

32. (Previously Presented) The expansion culture medium according to the Claim 31, wherein the autologous human serum is treated to inactivate a complement.

33. (Previously Presented) The expansion culture medium according to the Claim 31, wherein the autologous human serum is obtained from a blood sample of a patient.

34. (Cancelled)

35. (Cancelled)

36. (Previously Presented) The expansion culture medium according to Claim 31, further comprising:

an antibiotic.

37. (Previously Presented) The expansion culture medium according to Claim 36, wherein the antibiotic includes one of penicillin, streptomycin, gentamicin and mixtures thereof.

38. (Previously Presented) The expansion culture medium according to Claim 31, further comprising at least one of amphotericin B and a Fibroblast Growth Factor (FGF).

39. (Previously Presented) The expansion culture medium according to Claim 31, wherein the expansion culture medium comprises:

89% medium HAM-F12;

10% autologous human serum of a patient supplemented with heparin between 0.1 and 100 UI/ml; and protamine between 0.1 and 100 UI/ml; and

1% penicillin/streptomycin.

40. (Previously Presented) The expansion culture medium according to Claim 39, wherein the 10% autologous human serum further comprises at least one of 0.25mg/ml of amphotericin B and 0.1 to 250 pg/ml of recombinant bFGF.

41. (Withdrawn) A method for preparing of autologous human progenitor stem cells, comprising:

mixing autologous human serum, heparin, protamine and basic nutrients,

wherein the autologous culture medium comprises:

- a) between 0.1% and 90% weight of autologous human serum;
- b) between 0.1% and 10.000 UI/ml heparin;
- c) between 0.1% and 10.000 UI/ml protamine; and
- d) a base culture medium including basic nutrients.

42. (Withdrawn) A method according to Claim 41, wherein the mixing step includes further mixing with at least one of antibiotics, amphotericin B and a Fibroblast Growth Factor.

43. (Withdrawn) A method according to Claim 41, wherein the autologous human serum is obtained by plasmapheresis.

44. (Withdrawn) Use of an autologous culture medium of autologous human progenitor stem cells for a culture in vitro, purification and expansion of autologous progenitor stem cells, wherein the autologous culture medium comprises:

- a) between 0.1% and 90% weight of autologous human serum;

- b) between 0.1% and 10.000 UI/ml heparin;
- c) between 0.1% and 10.000 UI/ml protamine; and
- d) a base culture medium including basic nutrients.

45. (Withdrawn) A method for preparing a composition of autologous human progenitor stem cells, comprising:

incubating the autologous human progenitor stem cells in an autologous culture medium of autologous human progenitor stem cells; and

purifying the autologous human progenitor stem cells,

wherein the autologous culture medium comprises:

- a) between 0.1% and 90% weight of autologous human serum;
- b) between 0.1% and 10.000 UI/ml heparin;
- c) between 0.1% and 10.000 UI/ml protamine; and
- d) a base culture medium including basic nutrients.

46. (Withdrawn) A method according to Claim 45, wherein the purifying step is performed using specific antibodies which allow an identification of extracellular antigens characteristic of the autologous human progenitor stem cells.

47. (Withdrawn) A method according to Claim 45, wherein the specific antibodies for the autologous human progenitor stem cells are joined to magnetic microspheres.

48. (Withdrawn) A method for obtaining autologous human muscle progenitor stem cells, comprising:

incubating the autologous human muscle progenitor stem cells in an autologous culture medium of autologous human progenitor stem cells; and

purifying the autologous human progenitor stem cells,

wherein the autologous culture medium comprises:

- a) between 0.1% and 90% weight of autologous human serum;
- b) between 0.1% and 10.000 UI/ml heparin;
- c) between 0.1% and 10.000 UI/ml protamine; and

d) a base culture medium including basic nutrients.

49. (Withdrawn) A method according to Claim 48, wherein the purifying step includes:
utilizing human anti-CD56 antibodies, and
selecting the cells which show a phenotype CD56+/ CD45-.

50. (Withdrawn) A method according to claim 49, wherein the human anti-CD56 antibodies are joined to magnetic microspheres.

51. (Withdrawn) A method according to Claim 48, wherein the purifying step includes the substeps:

subjecting cell culture to a stage of pre-plating to settle at least part of the fibroblasts present in the cell culture and

subsequently, identifying and separating the autologous human muscle progenitor stem cells by using human anti-CD56 antibodies and the selection of the cells which show a phenotype CD56+/ CD45-.

52. (Withdrawn) A method according to claim 51, wherein the human anti-CD56 antibodies are joined to magnetic microspheres.

53. (Withdrawn) A procedure for obtaining autologous human muscle progenitor stem cells, from a biopsy of muscle tissue, to prepare a pharmaceutical composition, comprising:

a) performing a biopsy in a patient to be implanted with the autologous human muscle progenitor stem cells to extract therefrom a fragment of skeletal tissue which comprises the autologous human muscle progenitor stem cells;

b) culturing the autologous human muscle progenitor stem cells from the skeletal muscle in an autologous culture medium of autologous progenitor stem cells under conditions which allow expansion of the cultured autologous human muscle progenitor stem cells;

c) purifying the cultured autologous human muscle progenitor stem cells; and

d) collecting the purified autologous human muscle progenitor stem cells,
wherein the autologous culture medium comprises:

- a) between 0.1% and 90% weight of autologous human serum;
- b) between 0.1% and 10.000 UI/ml heparin;
- c) between 0.1% and 10.000 UI/ml protamine; and
- d) a base culture medium including basic nutrients.

54. (Withdrawn) A procedure according to Claim 53, further comprising:
e) freezing the purified autologous human muscle progenitor stem cells until a time of preparation of the pharmaceutical composition.

55. (Withdrawn) A procedure according to Claim 53, further comprising:
before the performing step, locally administering to the patient in an area of the biopsy a pharmaceutical composition which comprises a pharmacological agent which stimulates proliferation of autologous human muscle progenitor stem cells.

56. (Withdrawn) A procedure according to Claim 53, wherein the pharmacological agent comprises a local anesthetic comprising one of lidocaine and bupivacaine.

57. (Withdrawn) A method according to Claim 53, wherein the purifying step comprises:
subjecting the cell culture to a stage of pre-plating to settle at least part of the fibroblasts present in the cell culture, and
subsequently, identifying and separating the autologous human muscle progenitor stem cells by using human anti-CD56 antibodies and the selection of the cells which show a phenotype CD56+/ CD45-.

58. (Withdrawn) A method according to claim 57, wherein the human anti-CD56 antibodies are joined to magnetic microspheres.

59. (Withdrawn) A composition enriched in autologous human muscle progenitor stem cells, comprising:
at least 70% of the autologous human muscle progenitor stem cells in an autologous culture medium of autologous human muscle progenitor stem cells,

wherein the autologous culture medium comprises:

- a) between 0.1% and 90% weight of autologous human serum;
- b) between 0.1% and 10.000 UI/ml heparin;
- c) between 0.1% and 10.000 UI/ml protamine; and
- d) a base culture medium including basic nutrients.

60. (Withdrawn) A pharmaceutical composition, comprising:

at least 20 million cells, with a cell density of at least 50 million cells/ml;

at least 40% autologous progenitor stem cells CD56+/ CD45-, an autologous culture medium of autologous progenitor stem cells; and

at least one pharmaceutically acceptable excipient,

wherein the autologous culture medium comprises:

- a) between 0.1% and 90% weight of autologous human serum;
- b) between 0.1% and 10.000 UI/ml heparin;
- c) between 0.1% and 10.000 UI/ml protamine; and
- d) a base culture medium including basic nutrients.

61. (Withdrawn) A pharmaceutical composition according to Claim 60, further comprising:

between 20 and 200 million cells with a cellular density between 50 and 70 million cells/ml; and

at least 70% autologous progenitor stem cells CD56+/ CD45-, autologous culture medium of autologous progenitor stem cells and human albumin in a quantity between 0.1% and 20% weight with respect to the total quantity,

wherein the autologous culture medium comprises:

- a) between 0.1% and 90% weight of autologous human serum;
- b) between 0.1% and 10.000 UI/ml heparin;
- c) between 0.1% and 10.000 UI/ml protamine; and
- d) a base culture medium including basic nutrients.

62. (Withdrawn) A therapeutical procedure of autologous cellular cardiomyoplasty to create, regenerate and repair dysfunctional myocardial tissue using an implant of a pharmaceutical

composition which comprises autologous human muscle progenitor stem cells, regenerators of cardiac tissue, and ex vivo expanded in an autologous culture medium, comprising:

collecting a material sample from the body of a patient to be implanted with autologous human muscle progenitor stem cells, the sample including autologous muscle progenitor stem cells;

expanding the cells by culture in an autologous culture medium of autologous progenitor stem cells; and

implanting the collected autologous human progenitor stem cells in the patient containing the autologous human muscle progenitor stem cells,

wherein the autologous culture medium comprises:

- a) between 0.1% and 90% weight of autologous human serum;
- b) between 0.1% and 10.000 UI/ml heparin;
- c) between 0.1% and 10.000 UI/ml protamine; and
- d) a base culture medium including basic nutrients.

63. (Withdrawn) A therapeutical procedure of autologous cellular cardiomyoplasty to create, regenerate and repair dysfunctional myocardial tissue using an implant of a pharmaceutical composition which comprises autologous human muscle progenitor stem cells, regenerators of cardiac tissue, and ex vivo expanded in an autologous culture medium; the procedure comprising the steps of:

- a) collecting from a patient of a skeletal muscle biopsy;
- b) preparing a culture medium of autologous human progenitor stem cells from autologous serum of the patient;
- c) preparing a composition enriched in autologous human muscle progenitor stem cells from the biopsy of a) and the culture medium of b);
- d) preparing a pharmaceutical composition from the composition of c); and
- e) implanting a pharmaceutical composition of autologous human progenitor stem cells of d) in myocardial lesions,

wherein the autologous culture medium comprises:

- a) between 0.1% and 90% weight of autologous human serum;
- b) between 0.1% and 10.000 UI/ml heparin;

- c) between 0.1% and 10.000 UI/ml protamine; and
- d) a base culture medium including basic nutrients.

64. (Withdrawn) A procedure according to Claim 63, further comprising: the step of:
before the collecting step, intramuscularly injecting a local anesthetic.

65. (Withdrawn) A procedure according to Claim 63, wherein the implanting step is performed by one of (i) direct injection in the peripheral region to the infarction scar and (ii) injection in the intracoronary spaces of both ventriculi.

66. (Withdrawn) A procedure according to Claim 63, wherein the implanting step is performed by systemic or intracoronary administration by percutaneous venous access.

67. (Withdrawn) A procedure according to Claim 63, wherein the implanting step is performed by a robotized and computerized system.